**Template | Unit Enhancement**

***EXPLANATION & ARGUMENTATION***

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Background Information**

**Instructional Materials Title:** Land & Water

**Publication Date:**

**Work Group Participants:** Marcia Ventura, Robyn Horton, Autumn Doss, Heather St. John, Philip Bell

**Date Developed:** August 21, 2013

**High Leverage Lesson (Title and Page Number):**

* Lesson 4: Investigating Streams
* SPS Instructional Guide p.27

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Rationale**

**Why we identified this particular lesson:** Erosion and deposition are key science concepts, and the data table lends itself to the CER science explanation

**Connections to NGSS Practices and WA Science Standards:** [see SPS Instructional Guide]

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Explanation* Lesson Enhancement**

**Part 1: Lesson Modifications to Lead Up to *Explanation* Experience**

Lesson 4 has been modified to include use of the CER framework to support students in making sense of their data table from these experimental trials. There is a focus on making sure students understand erosion with possible connections made to deposition as a related process if it should come up. Student groups generate claims based on their thinking, identify their evidence and specify their reasons. The whole class moves towards a consensus understanding through developing a shared CER.

**Part 2: *Explanation* Learning Sequence**

Prior to unit: CER introduction (outside of science, engaging)

Lesson 3: CER partner writing, shared

Lesson 4: 1st CER alone, then opportunities to revise/look at other examples

* Whole class data consensus with pictures
* Groups/partners create Claim-Evidence-Reasoning response for the question
* Then discuss as a class, each group presenting their claim and evidence
* Decide on one claim together (classroom consensus)
* Students then work on their own version of CER
* Teacher assess individual responses
* Possible whole class shared writing activity

Lesson 14: final CER Assessment

**Part 3-A: Describe Assessment Task**

*Include the* ***question****,* ***evidence*** *students will use, and* ***scientific concepts*** *students will use in their reasoning.*

**Question:** What is the effect of a flowing stream on the land?

**Evidence:** Student observations (qualitative), data from table (depth of stream channel, width of stream channel – ideally focused on erosion data at this point). Students may use data on width of deposited soil, length of deposited soil, depth of deposited soil, and/or depth of soil collected in cylinder, even though those data points focus on deposition. Students probably won’t yet have the vocabulary words *erosion* and *deposition*, so may use alternative language such as *dropped off*, *washed away*, *gathered*, etc.

**Scientific Concepts:** Erosion is the movement of Earth materials by processes such as wind, water, ice, and gravity (4-5ES2C)

**Part 3-B: Assessment Rubric**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Claim: A statement or conclusion that answers the original question/problem.** | **Evidence: Scientific data that supports the claim. The data need to be appropriate and sufficient to support the claim.** | **Reasoning: A justification that connects the evidence to the claim. It shows why the data count as evidence by using appropriate and sufficient scientific principles.** |
| **1** | Does not make a claim, or makes an inaccurate claim like, “Water makes the land melt.” | Does not provide evidence, or only provides inappropriate evidence or vague evidence, like, “ | Does not provide reasoning, or only provides inappropriate reasoning like, “ |
| **2** | Makes an accurate but vague claim like, “The water makes the land wet.” | Provides 1 piece of evidence: Student observations (qualitative), depth of stream channel, width of stream channel and possibly using width of deposited soil, length of deposited soil, depth of deposited soil and/or depth of soil collected in cylinder. | Starts to hint/describe the scientific reasoning (erosion) but may not be complete or link back to the data. |
| **3** | Makes an accurate and complete claim like, “The stream moves the small parts of the land but leaves the bigger pieces.” | Provides 2 pieces of evidence:  Student observations (qualitative), depth of stream channel, width of stream channel and possibly using width of deposited soil, length of deposited soil, depth of deposited soil and/or depth of soil collected in cylinder. | Accurately describes the scientific reasoning (erosion) and how the data connects to it but may use the scientific terms. |
| **4** | Makes an accurate, concise and detailed claim like, “A flowing stream causes land to wash downstream.” | Provides 3 or more pieces of evidence (qualitative and quantitative): Student observations (qualitative), depth of stream channel, width of stream channel and possibly using width of deposited soil, length of deposited soil, depth of deposited soil and/or depth of soil collected in cylinder. | Completely describes and links the scientific reasoning (erosion and deposition) and uses at least one scientific term. |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Additional Information**

NOTES

· Information that will be useful when teaching this lesson

- Resources that will be useful

- Scaffolds that students will use